REMARKS

Claims 236, 238, and 240-249 are currently pending and are under examination. With this amendment, claim 242 has been amended to correct for the antecedent basis in this case.

Applicants respectfully request entry of the above amendment and reexamination and reconsideration in light of the following remarks.

1. Claim rejections under 35 USC § 103(a)

Claims 236, 238, and 240-248 stand rejected under 35 USC § 103(a) as being unpatentable over Newmark, et al. (US patent 6,391,346; "Newmark") and Babish, et al. (US 2002/0068098; "Babish") and as evidenced by Hill et al. (GB 2,336,363; "Hill"). The Applicants traverse this rejection.

The Examiner cites (Action: page 4, 2nd paragraph) Newmark as teaching an orally administered composition for reducing inflammation comprising a hops extract; further asserting that the composition of Newmark would be expected to comprise tetrahydoisohumulone (and as evidenced by Hill). The Applicants respectfully maintain that the Examiner's assertion that the composition of Newmark would be expected to comprise tetrahydoisohumulone is in error. CO_2 extracts of hops, absent additional processing, contain alpha and beta acids and not tetrahydroisohumulone, a reduced isoalpha acid as evidenced by the product page for a CO_2 extracts of hops as commercially available from Hopsteiner S.S. Hopsteiner, Inc., N.Y., USA., copy attached). Newmark neither teaches nor suggests that the reduced isoalpha acids have any antiinflammatory properties and Hill fails to correct these deficiencies.

Hill is directed to methods for hydrogenation of hops acids. While Hill merely states that the invention may be practiced using alpha acids (see page 2, lines 5-6), Hill only exemplifies the reduction of isomerized alpha acids to form tetrahydroisoalpha acids. Hill fails to teach that the tetrahydroisohumulones produced by their methodology have any antiinflammatory properties, thereby failing to correct Newmark's defeciencies in this matter. The Applicants maintain that the

mere fact that the reduced isoalpha acids (dihydro-isohumulone, dihydro-isocohumulone, dihydro-adhumulone, tetrahydro-isohumulone, tetrahydro-isocohumulone, tetrahydro-adhumulone, hexahydro-isohumulone, hexahydro-isocohumulone, and hexahydro-adhumulone) may be derived from the alpha acids of hops is insufficient to infer that alpha acids and reduced isoalpha acids have similar properties. For example, consider coal and a diamond. Both are the same material, i.e., carbon, but each has disparate properties which can not be inferred by their similarity. Or consider the difference between salicylic acid its reduced congeners salicylaldehyde and salicylic alcohol. Salicylic acid is a well-known and widely used NSAID (non-steroidal anti-inflammatory drug). However upon reduction (using an appropriate metal hydride e.g., LiAlH4 or NaBH4) the resulting reduced products, salicylic alcohol & salicylaldehyde, are potent allergens. The Applicants maintain that this example fully illustrates both that even compounds of similar structure or compounds derived from reduction of a parent compound need not have similar biologic activities and as such are not obvious. The Examiner's attention is directed to see Aalto-Korte et al., "Allergic contact dermatitis from salicyl alcohol and salicylaldehyde in aspen bark (Populus tremula)," Contact Dermatitis, Vol. 52(9)2: 93-95 (2005), for a description of this phenomenon.

The Examiner next cites Babish as teaching a composition for inhibiting the inflammatory response in animals wherein the composition comprises, in part, oleanoicl acid and ursolic acid. However, as the Examiner points out, Babish fails to teach tetrahydroisohumulone as required by the instant case. The Examiner asserts that it would have been obvious to combine Babish with Newmark to produce the instant invention. The Applicants disagree insofar as Babish fails to correct the deficiencies of Newmark by failing to teach or suggest that the reduced isoalpha acids have anti-inflammatory properties. As such, Applicants respectfully request the withdrawal of the rejection of Claims 236, 238, and 240-248 under 35 USC § 103(a).

Claims 236, 238, and 240-249 stand rejected under 35 USC § 103(a) as being unpatentable over Newmark, et al. (US patent 6,391,346; "Newmark") and Babish, et al. (US 2002/0068098; "Babish") and as evidenced by Hill et al. (GB 2,336,363; "Hill"). The Applicants traverse this rejection.

The Examiner applies Newmark and Babish in their entirety as to Claims 236, 238, and 240-248. The Examiner notes that Newmark fails to teach the use of glucosamine whereas Babish teaches that the composition further comprises glucosamine. The Examiner asserts that one of skill in the art would have been motivated to use glucosamine (or chondroitin sulfate) to normalize joint movement and reduce the symptoms of osteoarthritis. The Applicants respectfully disagree.

As discussed previously, Babish and Hill fail to correct the deficiencies of Newmark vis-á-vis the use of reduced isoalpha acids as anti-inflammatories. The use of Babish as to glucosamine as to normalize joint movement and reduce the symptoms of osteoarthritis fails to correct this and further fails to produce the instant invention. The Applicants maintain that nothing in Newmark, Hill, or Babish teach or suggest the instant invent and as such, Applicants respectfully request the withdrawal of the rejection of Claims 236, 238, and 240-249 under 35 USC § 103(a).

II. Double Patenting

Claims 236, 238, and 240-249 are provisionally rejected under the doctrine of obviousness-type double patenting over Claims 1, 6-10, and 13-15 of US Patent Application No. 10/557293; Claims 1-8 of of US Patent Application No.11/729696; and Claims 1, 9, 13-14, 18-27, and 152-154 of US Patent Application No. 10/464410.

The Applicants accept the Examiner's determination and herein provide terminal disclaimers linking the instant case to the cited cases.

III. CONCLUSION

On the basis of the foregoing remarks and amendments, Applicants respectfully submit that amended Claims 236, 238, and 240-249 are in condition for allowance. Passage to issue is respectfully requested.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicant's agent at the telephone number shown below. The commissioner is hereby authorized to charge any fees required in connection with filing of this paper to our Deposit Account 50-1133.

A Request for a Three (3) Month Extension of Time, up to and including April 1, 2011 is included herewith. Pursuant to 37 C.F.R. § 1.136(c), the Examiner is authorized to charge any fee under 37 C.F.R. § 1.17 applicable in this instant, as well as in future communications, to Deposit Account 50-1133. Furthermore, such authorization should be treated in any concurrent or future reply requiring a petition for an extension of time under paragraph 1.136 for its timely submission, as constructively incorporating a petition for extension of time for the appropriate length of time pursuant 37 C.F.R. § 1.136(a) regardless of whether a separate petition is included.

Respectfully submitted,
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Dated: April 1, 2011

By: 

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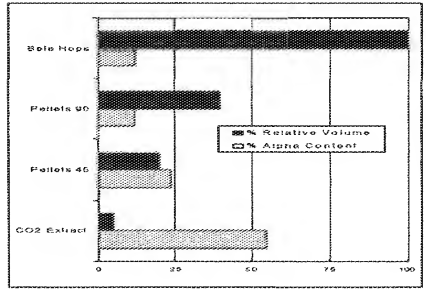
Hopsteiner®

CO_2 Extract

❖ Overview:

- **CO_2 Extract** is an extract of hops produced by extraction of hop pellets using carbon dioxide under liquid or supercritical conditions.
- **CO_2 Extract** contains alpha-acids, beta-acids and essential oils and is normally used as a partial or complete replacement for kettle hops or hop pellets.
- **CO_2 Extract** is an extremely stable, convenient and concentrated alternative to the use of hops or hop pellets.

Reduction in Bulk of a 12% Alpha Hop by Changing to Processed Hop Products



❖ Specification:

- **Description:** A golden to amber, semi-fluid syrup or paste
- **Alpha-acids:** Variety specific; typically c. 35% for an aroma hop and >50% for a high alpha hop.
- **Beta-acids:** Variety specific; normally in range 15 - 40%
- **Hop oils:** Variety specific; typically 3-12%
- **Density:** Typically 0.9 – 1.0 g/ml

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Hopsteiner®

❖ Properties

□ Appearance:
A golden or amber thick syrup which becomes more fluid on warming.

□ Utilisation:
Early addition of **CO_2 Extract** to the wort boil normally results in a fractionally higher utilization of the á-acids into the beer than that of corresponding Type 90 Pellets, typically in the range 32 – 38%. Late additions may have utilizations as little as one half of these values.

□ Flavor:
The brewing characteristics of the original hops are maintained. Therefore, early addition of **CO_2 Extract** to the kettle imparts mainly bitterness, while late addition allows carry over of a proportion of the volatile oils resulting in a beer with aromatic "late hop" character.

□ Stability:
CO_2 Extract is exceptionally stable when correctly stored. Particularly, the hop oils are preserved in the condition as they were in the hops at the time of extraction.

□ Chemical Residues:
Nitrates and heavy metals are significantly reduced in **CO_2 Extract**. Pesticide residues are also largely removed by CO_2 extraction.

□ Quality:
All Hopsteiner® products are produced in plants accredited to internationally accepted quality standards.

❖ Packaging

CO_2 Extract can be packaged in cans, pails and drums according to customer requirements:
Cans: 0.5 to 4 kgs (9 lb); 0.5-6 kgs Germany
Pails: 3 to 20 kgs (6.5 - 44 lb); USA only
Drums: 50 & 200 kgs (110 - 441 lb)

For convenience of use, customers may have their extract packed in cans to any desired content of á-acids per container (e.g. 450 g alpha per can).

Alternatively, the á-acids content of **CO_2 Extract** can be standardized to any particular concentration using glucose syrup (non-GM glucose cannot be guaranteed) and the container filled to a standard weight (e.g. 30% alpha in 1-kg cans).

❖ Product Use

Typically used in the kettle as a complete or partial replacement for hops or hop pellets.

□ Dosage:
Addition to the kettle is based on the á-acids concentration in the **CO_2 Extract** and the assumption that the utilization is likely to be slightly better than that achieved with hops or hop pellets. Actual utilization will vary from brewery to brewery depending on plant and process conditions.

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Hopsteiner®

❑ Addition:

For the best utilization **CO_2 Extract** should be added early in wort boiling. However, owing to likely losses caused by protein precipitation, the product is best added 10 mins. after the start of boiling. For imparting "late hop" character, extract should be added not less than 5 mins. before kettle cast. If extract is used in cans, it does not need to be warmed prior to use. However should **CO2 Extract** be used in automatic dosing units, it should be warmed to 30°C (82°F) and gently mixed to ensure perfect dosing.

❑ Storage:

CO_2 Extract should be stored in sealed containers below 10°C (50°F). Opened containers should be used within a few days.

❑ Safety:

CO_2 Extract is a natural, non-toxic substance and may be safely handled using routine precautions to avoid contact with skin and, particularly, eyes. Any material coming into contact with the skin should be washed off with soap and water or proprietary hand cleansers. If **CO_2 Extract** gets into the eyes, irrigate with excess water until clear and seek medical attention.

For full safety information please see the relevant Steiner material safety data sheet.

❖ Analytical Methods

❑ Concentration of á- and â-acids:

The concentration of these hop resin acids is measured by HPLC using the current ICE standard, normally according to the EBC 7.8 method. ASBC spectrophotometric method EBC 7.6 (LCV) can also be used.

❑ Concentration of Hop oils:

Hop oil concentration is normally measured by the following methods - IOB 6.3 or ASBC hops-13.

❖ Technical Support

We will be pleased to offer help and advice on the full range of Hopsteiner® products:

- ❑ Copies of all relevant analytical procedures
- ❑ Material Safety Data Sheets (MSDS)
- ❑ Assistance with pilot or full brewery trials
- ❑ Specialist analytical services

PDS 05/2 issued 15-Jun-00

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Attachment

Contact Dermatitis 2005: 52: 93–95
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CONTACT DERMATITIS

Allergic contact dermatitis from salicyl alcohol and salicylaldehyde in aspen bark (*Populus tremula*)

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Salicyl alcohol or 2-methylolphenol is a well-known allergen in phenol-formaldehyde resins and a strong sensitizer in guinea pigs. There is 1 previous report of allergic contact dermatitis from salicyl alcohol in aspen bark. We describe a second case with concomitant allergy to salicylaldehyde. An elk researcher who had handled leaves from various trees presented with eczema of the hands, face, flexures, trunk and extremities. Patch testing showed sensitivity to salicyl alcohol, salicylaldehyde, balsam of Peru (Myroxylon pereirae resin), aspen wood dust and an extract prepared from the bark of aspen (*Populus tremula*). Weaker reactions were observed to bark extracts of rowan (*Sorbus aucuparia*), tea-leaved willow (*Salix phylicifolia*) and goat willow (*Salix caprea*). We analysed salicyl alcohol and salicylaldehyde in the bark extracts and found the 2 chemicals in equal amounts, about 0.9 μg/mg in aspen bark and in lower concentrations in rowan and the willows. We did not find either of the chemicals in the test substance of balsam of Peru (*Myroxylon pereirae*). Besides salicyl alcohol, salicylaldehyde is also recommended to be used to screen for contact allergy to aspen. Both of these chemicals should be tested in forest workers in areas where aspen is growing.

Key words: aspen, balsam of Peru, CAS 8007-00-9, CAS 90-01-7, CAS 90-02-8, *Myroxylon pereirae*, occupational, *Populus tremula*, salicyl alcohol, salicylaldehyde. © Blackwell Munksgaard, 2005.

Accepted for publication 22 November 2004

Salicyl alcohol (2-hydroxybenzyl alcohol, 2-methylolphenol, CAS 90-01-7) is a crystalline substance that has been used as a local anaesthetic (1). It is soluble in organic solvents (e.g. alcohol, chloroform and ether) and hot water and slightly soluble in cold water. It is a well-known allergen of phenol-formaldehyde resins (2, 3). It is a strong sensitizer according to the guinea-pig maximization test (4). 1 patient with allergic contact dermatitis from salicyl alcohol in aspen bark has been diagnosed previously at Finnish Institute of Occupational Health (FIOH) (1). Salicylaldehyde (2-hydroxybenzaldehyde, CAS 90-02-8) is an oily liquid with an almond-like odour, slightly soluble in water, and it is used in perfumes and as a flavouring agent in food products (2). Trolab® (Hermal, Reinbek, Germany) perfumes and flavours series of patch test allergens includes salicylaldehyde. Salicylaldehyde and salicyl alcohol are chemically closely related, and simultaneous reactions have been reported in 5 patients with contact allergy to phenol-formaldehyde resin (2, 3).

Case Report

Our patient was a 58-year-old elk researcher with no history of atopy. In 1993, he developed eczema on his face and fingers during a field experiment in the forest, when he gathered masses of leaves of various coniferous and deciduous trees with his bare hands. The eczema spread to his flexures, trunk and extremities like atopic dermatitis but had a tendency to heal during periods of working indoors.

In 2002, he had an allergic reaction to balsam of Peru (Myroxylon pereirae resin) on patch testing in a local hospital. He had had some skin irritation from alcohol-containing deodorants but no symptoms from after-shave lotions or other cosmetic products containing fragrances.

In 2004 at FIOH, patch testing with the standard, fragrance and plant series showed allergic reactions to balsam of Peru (+) (Trolab®), salicyl alcohol (++, 2% aq. prepared from 2-methylolphenol) (Aldrich, Steinheim, Germany) and salicylaldehyde (+, 2% pet.) (Trolab®). After the positive reaction to salicyl alcohol was obtained,

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we asked him to bring samples of the trees he had handled. In February, there were no leaves on the trees, hence he brought small twigs of various deciduous trees (Table 1). Ultrasonic extracts from the barks of the small twigs were prepared by extracting about 500 mg of bark (the outer dark layer and the green layer beneath the dark layer) with 10 ml of sterile water in an ultrasonic bath for 30 min (1). The extracts were left overnight at room temperature and used for patch testing on the following day. The results are summarized in Table 1. Some wood dusts (fine sanding dusts) moistened in Finn Chambers® with water were also patch tested (Table 1). Prick tests with common environmental allergens and wood dusts were negative.

On follow-up, the skin symptoms were associated with contact with broken bark of aspen and willows, sawing the same wood species and using a lawn mower in an area where aspen saplings were growing. In September 2004, the patient had vesicular eczema on his right palm after handling twigs of dark-leaved willow (*Salix myrsinifolia*) with his bare hands.

Chemical Analyses

The wood dusts and ultrasonic extracts used in the patch tests were analysed for their salicyl alcohol and salicylaldehyde content by high-performance liquid chromatography with a UV detector and an external standard method as previously described (1). Accurately weighed amounts (about 100 mg) of the wood dusts were extracted for 2 × 15 min in an ultrasonic bath containing 10 ml of distilled water at room temperature. After storage for 1 night at room temperature, the sample solution was passed through a 0.45-μm Millex-HV filter before analysis. The detection limits for salicyl alcohol and salicylaldehyde were 0.001 μg/mg and 0.003 μg/mg, respectively. The results are summarized in Table 1.

The patch test preparation of balsam of Peru (25% pet.) was analysed by gas chromatography with a mass-specific detector, and neither of the 2 substances were found (detection limit 0.01% w/w).

Discussion

Aspen leaves are the main nutrition of elk, our patient's main interest in his research work. Elk are the largest existing deer (*Alces alces*) of Europe and Asia. When the eczema appeared during his work in the forest, he had also handled many other species of trees, including rowan, alder and various willows. The ultrasonic extract of aspen

Table 1. Results of the patch tests and chemical analyses of the patch test substances, wood dusts and ultrasonic extracts of wood barks

	Ultrasonic extract of the bark			Wood dust		
Wood species	Patch test D3	Salicyl alcohol μg/ml (μg/mg bark)	Salicylaldehyde μg/ml[a] (μg/mg bark)	Patch test D5	Salicyl alcohol (μg/mg)	Salicylaldehyde (μg/mg)
Aspen, *Populus tremula*	++	42 (0.88)	44 (0.92)	+	0.37	0.087
Rowan, *Sorbus aucuparia*	+	0.17 (0.0037)	6.5 (0.14)	–	<0.005	0.035
Tea-leaved willow, *Salix phylicifolia*	+	9.3 (0.17)	<0.15 (<0.0028)	NT	ND	ND
Goat willow, *Salix caprea*	+	11 (0.18)	9.6 (0.16)	–	0.049	<0.022
Dark-leaved willow, *Salix myrsinifolia*	–	3.3 (0.042)	8.8[b] (0.16)	NT	ND	ND
Grey alder, *Alnus incana*	–	<0.05 (<0.001)	1.3 (0.030)	NT	ND	ND
Silver willow, *Salix sibirica*	NT	ND	ND	–	0.072	<0.018
Common alder, *Alnus glutinosa*	NT	ND	ND	–	<0.007	<0.020
Oak, *Quercus robur*	NT	ND	ND	–	<0.009	0.053

ND = not determined; NT = not tested.
[a]Salicylaldehyde degrades slowly in water solution, and its concentration is only indicative.
[b]The high concentration may be due to a co-eluting compound.
The corresponding concentration in the bark is given in parenthesis.

bark contained much more salicyl alcohol and salicylaldehyde than the bark extracts of the other tree species. The patch test reactions to the bark extracts were mainly in line with their content of salicyl alcohol and salicylaldehyde. Only the extract of dark-leaved willow was negative in spite of its apparent relatively high content of salicylaldehyde. On follow-up, the patient also developed skin symptoms from this species. The high salicyl alcohol content of aspen dust also explained the positive reaction to the dust.

The fresh plant material contains salicyl alcohol and salicylaldehyde in the form of glucosides such as salicin (3, 6). It is possible that there are other more important allergens in the barks of aspen and willows, e.g. these glucosides. Extracting with both hot water and ethanol would probably have yielded more salicyl alcohol and aldehyde than extracting in water at room temperature, when the chemicals are poorly soluble. Especially, salicylaldehyde may have been under-extracted in our experiment.

It is possible that the allergic reactions to salicylaldehyde and salicyl alcohol were due to cross-allergy and not due to simultaneous sensitization. The patient was exposed to both of the chemicals in equal amounts. The first aspen-allergic patient at FIOH reacted only to salicyl alcohol and not to salicylaldehyde (1), favouring the possibility of simultaneous sensitization. It is possible that the present patient was primarily sensitized to fragrances, but he had not had typical symptoms of fragrance contact allergy, and the reaction to salicyl alcohol was stronger than those to salicylaldehyde and balsam of Peru. We conclude that our patient probably had occupational allergic contact dermatitis from exposure to salicyl alcohol and salicylaldehyde in the barks of aspen, rowan and willows.

This is the second case of contact allergy from aspen bark caused by salicyl alcohol. At the time of the first case, the analysis of aspen bark by gas chromatography and mass spectrometry yielded 4 chemicals of which the allergen, salicyl alcohol, was identified by patch testing (1). The other 3 chemicals were salicylaldehyde, benzoic acid and benzyl benzoate (1). In contrast to the first patient, the present patient also reacted to salicylaldehyde. Both of the patients had positive reactions to balsam of Peru. We could not find salicyl alcohol or salicylaldehyde in the test substance of balsam of Peru. The patch tests of the present patient did not include benzoic acid or benzyl benzoate, the common constituents of aspen bark and balsam of Peru (7). These rare sensitizers were negative on patch testing in the first case (1).

Besides salicyl alcohol, salicylaldehyde is also recommended to be used to screen for contact allergy to aspen bark. Thus, it should be added to the patch test series of forest workers in areas where aspen is growing. These contact allergens are also found in rowan and willows, although in lower concentrations than in aspen.

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